US Army Corps of Engineers ®
Portland District

Salmon Recovery through John Day Reservoir

John Day Drawdown
Phase I Study

Economic Analysis Technical Appendix
Social Section






September 2000

JOHN DAY DRAWDOWN PHASE 1 STUDY

SOCIAL STUDIES ANALYSIS

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November 29, 1999

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1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This report offers an overview of the types of economic and social effects that should be carefully examined to determine the impact of breaching the John Day Dam. While quantitative information is provided where possible, this report is primarily intended to identify the qualitative impact of changes caused by breaching the dam. Estimates of economic impact are necessarily vague at this stage of the process, and that makes determination of the social impacts even more problematic. In addition, drawdown would not occur until about 2013, and much could change between now and then. Further, the impact is likely to be affected by the decision made regarding the four dams on the Snake River. Hence, some consideration of these alternatives is necessary. Finally, tribal impacts are discussed in other reports and are not covered extensively in this analysis.

1.2 GEOGRAPHIC SCOPE

The geographic scope is focused on the area most directly impacted by the dam's pool. Previous studies have identified the area around the pool as the "downriver" area associated with the analysis of the Snake River dams. For consistency with these earlier analyses, the same geographic area was identified for this study. The impacts to be discussed are more concentrated than this area would suggest, but the benefits of consistency with previous studies argue for the larger area. The "downriver" area is defined as coming after the Snake River dams and encompasses both the McNary and John Day dams. The alternatives under consideration will affect the operation of McNary, but the changes being considered largely relate to the Snake River dams and the John Day dam. Hence, most of the impact to be discussed will be focused on the areas around the John Day pool.

The "downriver" area consists of Benton, Franklin, Klickitat, and Skamania counties in Washington, and Gilliam, Hood River, Morrow, Sherman, Umatilla, and Wasco counties in Oregon. While impacts on other areas would occur, the effects are likely to have been captured in the analysis done for the Snake River dams. In particular, regional effects would be quantitatively different from those associated with the Snake River analysis, but they should not be qualitatively different. However, the targeted effects of the change in operation of the John Day dam would result in impacts that are substantially more focused on this area.

2.0 ECONOMIC OVERVIEW

The economic effects of breaching the John Day Dam will be most concentrated on the area adjacent to and immediately upriver from the dam. This region consists of large areas that are primarily agriculture and natural resource oriented along with one major urban concentration, the Tri-Cities area, and several smaller urban concentrations. While there may be some regional effects from breaching, they would tend to be minor relative to any of the affected state economies. All three states likely to be impacted, Idaho, Oregon, and Washington, have had similar experiences with divergent forces affecting the urban and rural economies. Each state has a major urban area that has experienced significant growth in "high tech" industries while rural areas have largely continued to rely on their traditional industries. For example, an analysis of high tech employment in Oregon found several of the counties in the mid-Columbia area with no employment related to high tech. Due to the strength of the high tech sectors and the forecasts of continued growth, the impacts of breaching on the overall economies of the three states would be hard to identify. Impacts that should be considered are more focused. At the state level, three possibilities have been identified. The first is the possibility that downriver navigation would be affected by changes in water flow, thus affecting the Port of Portland primarily and the shippers who use the port. The second is the impact of the increase in electric power costs and potential flood damage. These are likely to be small for the state as a whole but they may affect certain groups or areas disproportionately. Third, the benefits or costs of changes in recreational possibilities are likely to accrue significantly within the region's urban areas, since the Columbia Gorge is a major recreation destination for the urbanites in the region. Most of the remainder of the discussion will focus on the more direct impacts expected in the region adjacent to the dam and its pool.

The Oregon side of the river is relatively more homogenous with respect to the rural versus urban character than the Washington side, and it is useful to consider the description of the economy developed by the Oregon Department of Labor. This area is identified as regions 9 and 12 for the state, and the following is taken from the Department's regional analyses.

> Region 9 is a grab bag of counties that consists of Gilliam, Hood River, Sherman, Wasco, and Wheeler. This region is located in the north-central portion of Oregon. The Columbia River, second largest in the U.S., borders the northern part of the region. This region, based on 1996 population estimates, contains the three least-populous counties in the state: Gilliam (1,900), Sherman (1,900), and Wheeler (1,600). The combined total for these three, 5,400, is less than the population of the next-smallest county, Wallowa (7,250). By comparison, the other two counties, Hood River (19,000) and Wasco (22,500), are bursting at the seams. The largest cities in the region, unsurprisingly, are located in these two counties: Hood River (population 5,110) in the county of the same name and The Dalles (11,460) in Wasco.
>
> The region boasts a number of scenic attractions, which, in addition to the Columbia River and Columbia Gorge, include the John Day fossil beds, Mt. Hood, and national

forest areas. The Columbia River Highway, completed eighty-some years ago, was the Northwest's first paved highway. Beginning with the completion in 1937 of Bonneville Dam, much of the state's electricity and water for irrigation has been supplied by the area's hydroelectric projects, which also include The Dalles and John Day dams. Recreation has been a growing source of employment in the region, which has received recognition as a mecca for windsurfers. Hunting and fishing opportunities are also plentiful, along with other outdoor recreation attractions.

In 1996, nonfarm payroll employment in the region was 18,400, an increase of 4,600 jobs over the past twenty years. Nearly three-fourths of these new jobs have been in trade and service industries.

Region 12 consists of two counties, Morrow and Umatilla, located in the northeast portion of Oregon and bordered on the north by the Columbia River and the state of Washington. A major portion of the region, particularly in the case of Umatilla County, consists of national forest: the Umatilla, Wallowa, and Whitman national forests.

Umatilla (1996 population: 65,500) is the more populous county of the two; Morrow 's comparable population was 9,000. Umatilla's largest cities are Pendleton (15,900) and Hermiston (11,050). Boardman (2,580 in 1996) is the largest city in Morrow County.

Umatilla County has become a major center for wholesale and retail trade, with employment of 5,480 in this industry group in 1996. Its services sector, at 4,580 jobs in the same year, is also healthy and substantial. In Morrow County, government is the industry claiming the largest work force (790 in 1996), with food and kindred products manufacturing (620) coming in second. (Source: Oregon Employment Department, *1998 Regional Economic Profile, Region 9* and *1998 Regional Economic Profile, Region 12.*)

While the regional economic profiles offer a good overview, the area covered includes sectors that would not be affected by the proposed changes. For example, windsurfing is not likely to be affected by the contemplated changes in dam operations. Much of the Washington side would be expected to be similar in the rural areas, but the area around Hanford dominates many of the statistics. Hence, it is worthwhile to start our detailed discussion of the counties by looking at this area.

2.1 COUNTY PROFILES

State employment division data was used to provide some general information on each of the counties included in the impact area. This information is largely taken from public files of the employment divisions of Oregon and Washington and from the Oregon Blue Book. This is intended as a general overview of the counties in the indentified area, and not all counties nor all industries in each county would be impacted by the changes in dam operations.

2.1.1 Benton and Franklin Counties, Washington

The Tri-Cities region is an agricultural center, with a related food processing industry. Agri-chemical industry along the banks of the Columbia near Kennewick also is a major component of the region's economy.

While the Hanford facilities are an important factor in the regional economy and are largely insulated from any changes that might occur due to dam operations, agriculture is still an important factor in the region's economy. The level of dependence on irrigation and the effects of dam breaching are likely to be noticed even in Benton county, which is among the least agriculture dependent of the counties in the region.

Direct agricultural employment in 1990 amounted to 8,728 workers and another 3,294 were employed in the food processing industry. In total, agriculture and related employment in the Tri-Cities reached 12,869, not that far removed from the number employed by Hanford.

Unemployment in Benton and Franklin counties is two-tiered. In Franklin County, the percentage of unemployed is consistently larger than in Benton County, and the difference has widened in recent years. The gap between the two can largely be explained by the seasonality of the agricultural work that predominates in Franklin County and the stability of Hanford employment in Benton County. And, the share of Franklin's total employment devoted to agriculture has increased far more than Benton's in the near past.

Table 1: GENERAL PROFILE Benton, WA

POPULATION AND HOUSING (Bureau of the Census)	
Total resident population:	
1995	**133,070**
Percent 65 years and over	**9.6**
1990	**112,560**
1980	**109,444**
Occupied housing units, 1990	**42,227**
Percent owner occupied	**63.1**
BIRTHS AND DEATHS (National Center for Health Statistics)	
Births, 1993	**1,977**
Per 1,000 resident population	**15.9**
Percent to mothers under 20 years of age	**12.0**
Deaths, 1993	**775**
Per 1,000 resident population	**6.2**
Infant deaths per 1,000 live births, 1993	**8.1**
EDUCATION (Bureau of the Census)	
Persons 25 years and over, 1990	**69,511**
Percent high school graduates	**83.9**
Percent college graduates	**23.3**
LABOR FORCE (Bureau of Labor Statistics)	
Civilian labor force, 1994	**70,625**
Percent unemployed	**5.4**
PRIVATE NONFARM ESTABLISHMENTS (Bureau of the Census)	
Total establishments, 1993	**2,863**
Percent retail trade	**26.2**
Percent services	**36.5**
Paid employees, 1993 (pay period including March 12)	**47,285**

Annual payroll, 1993 ($1,000)	1,358,442
PERSONAL INCOME (Bureau of Economic Analysis)	
Total personal income, 1993 ($1,000)	2,616,872
Per capita (dollars)	21,037
AGRICULTURE (Bureau of the Census)	
Number of farms, 1992	1,128
Land in farms as percent of total land	59
RETAIL TRADE (Bureau of the Census)	
Retail sales, 1992 ($1,000)	947,312
Per capita (dollars)	7,881
COMMERCIAL AND SAVINGS BANKS (Fed. Deposit Insurance Corp.)	
Number of offices, June 30, 1994	22
Total deposits ($1,000)	591,655
SOCIAL PROGRAMS (Social Security Administration)	
Total Social Security recipients, December 1993	15,715
Retired workers	10,010
Supplementary Security Income recipients, December 1994	1,225
FEDERAL FUNDS AND GRANTS (Bureau of the Census)	
Total direct expenditures or obligations per capita:	
1994 (dollars)	16,364
1990 (dollars)	11,951

Source: U.S. Bureau of the Census, USA Counties 1996 CD-ROM.

Table 2: GENERAL PROFILE Franklin, WA

POPULATION AND HOUSING (Bureau of the Census)	
Total resident population:	
1995	44,459
Percent 65 years and over	9.3
1990	37,473
1980	35,025
Occupied housing units, 1990	12,196
Percent owner occupied	59.7
BIRTHS AND DEATHS (National Center for Health Statistics)	
Births, 1993	980
Per 1,000 resident population	23.3
Percent to mothers under 20 years of age	19.2
Deaths, 1993	281
Per 1,000 resident population	6.7
Infant deaths per 1,000 live births, 1993	7.1
EDUCATION (Bureau of the Census)	
Persons 25 years and over, 1990	20,795
Percent high school graduates	68.1
Percent college graduates	13.4
LABOR FORCE (Bureau of Labor Statistics)	
Civilian labor force, 1994	22,103
Percent unemployed	8.6
PRIVATE NONFARM ESTABLISHMENTS (Bureau of the Census)	
Total establishments, 1993	944
Percent retail trade	20.9
Percent services	32.4
Paid employees, 1993 (pay period including March 12)	11,342
Annual payroll, 1993 ($1,000)	224,613
PERSONAL INCOME (Bureau of Economic Analysis)	
Total personal income, 1993 ($1,000)	721,221

Per capita (dollars)	17,234
AGRICULTURE (Bureau of the Census)	
Number of farms, 1992	857
Land in farms as percent of total land	84
RETAIL TRADE (Bureau of the Census)	
Retail sales, 1992 ($1,000)	325,508
Per capita (dollars)	8,042
COMMERCIAL AND SAVINGS BANKS (Fed. Deposit Insurance Corp.)	
Number of offices, June 30, 1994	8
Total deposits ($1,000)	220,241
SOCIAL PROGRAMS (Social Security Administration)	
Total Social Security recipients, December 1993	5,090
Retired workers	3,170
Supplementary Security Income recipients, December 1994	696
FEDERAL FUNDS AND GRANTS (Bureau of the Census)	
Total direct expenditures or obligations per capita:	
1994 (dollars)	3,672
1990 (dollars)	2,841

Source: U.S. Bureau of the Census, USA Counties 1996 CD-ROM.

2.1.2 Klickitat County, Washington

The agricultural pattern in the county's central valley is based on the rotation of soft winter wheat and alfalfa hay crops with cattle as the balancing factor. Agricultural patterns vary in the county's western and eastern extremes where soil composition and climates differ. Logging and lumber are also important industries.

Klickitat County maintains a relative balance between agriculture, livestock, food processing, government, and some aluminum reduction, fishing, logging and lumber production. Klickitat County's economy has long been associated with traditional, resource-based industries. These include farming, logging and timber operations, and more recently, aluminum production. While these industries have been, and are, the backbone of the county's prosperity, they are also the prime culprits in its higher than average unemployment rate. Farming employment is beset by seasonality, as is logging and timber production; aluminum employment is dependent upon cheap electricity and a volatile market that can render production unprofitable overnight.

This industrial base is quite a bit different than that of Washington State as a whole. Manufacturing is much stronger in the county, trade and services are much weaker, and government employment is markedly higher.

In recent years, migration has been a strong factor in the population growth. But from 1980-90, the county actually had a migratory net loss. While the natural population increase (births less deaths) was 1,085, net migration resulted in a minus 291--that many more people left the county than came to the county. From 1990-93, though, there has been strong in-migration. The natural increase during these three years was estimated at 248 while the migratory net was pegged at a positive 636.

Klickitat County's economy has a number of advantages and disadvantages. High unemployment is the greatest concern, but, even so, it is considerably lower than it has been in the past. Manufacturing employment is currently stagnant; the timber industry is at a standstill and the

immediate outlook for the aluminum industry is simply unknown. But there is ample room for development in the services and trade industries, and a nascent tourist industry could provide a boost to the economy. Finally, the stable and large government presence adds solidity to the employment base.

Table 3: GENERAL PROFILE Klickitat, WA

POPULATION AND HOUSING (Bureau of the Census)	
Total resident population:	
1995	18,231
Percent 65 years and over	13.1
1990	16,616
1980	15,822
Occupied housing units, 1990	6,210
Percent owner occupied	66.0
BIRTHS AND DEATHS (National Center for Health Statistics)	
Births, 1993	236
Per 1,000 resident population	13.5
Percent to mothers under 20 years of age	19.5
Deaths, 1993	151
Per 1,000 resident population	8.6
Infant deaths per 1,000 live births, 1993	12.7
EDUCATION (Bureau of the Census)	
Persons 25 years and over, 1990	10,568
Percent high school graduates	70.4
Percent college graduates	10.9
LABOR FORCE (Bureau of Labor Statistics)	
Civilian labor force, 1994	8,086
Percent unemployed	11.4
PRIVATE NONFARM ESTABLISHMENTS (Bureau of the Census)	
Total establishments, 1993	401
Percent retail trade	21.4
Percent services	26.7
Paid employees, 1993 (pay period including March 12)	3,243
Annual payroll, 1993 ($1,000)	72,410
PERSONAL INCOME (Bureau of Economic Analysis)	
Total personal income, 1993 ($1,000)	301,219
Per capita (dollars)	17,181
AGRICULTURE (Bureau of the Census)	
Number of farms, 1992	508
Land in farms as percent of total land	58
RETAIL TRADE (Bureau of the Census)	
Retail sales, 1992 ($1,000)	51,476
Per capita (dollars)	2,995
COMMERCIAL AND SAVINGS BANKS (Fed. Deposit Insurance Corp.)	
Number of offices, June 30, 1994	7
Total deposits ($1,000)	122,212
SOCIAL PROGRAMS (Social Security Administration)	
Total Social Security recipients, December 1993	3,285
Retired workers	2,020
Supplementary Security Income recipients, December 1994	366
FEDERAL FUNDS AND GRANTS (Bureau of the Census)	
Total direct expenditures or obligations per capita:	
1994 (dollars)	4,060
1990 (dollars)	3,143

Source: U.S. Bureau of the Census, USA Counties 1996 CD-ROM.

2.1.3 Skamania County, Washington

Fishing, logging and lumber were major industries in Skamania. In 1986, the Congress proposed and President Reagan signed legislation designating the Columbia River Gorge as a National Scenic Area. The act imposes land use and development controls on the area and is intended to preserve the Gorge for future generations. Tourism has an ever increasing role in the county's economy. Additionally, roughly 80 percent of Skamania County's land mass is part of the Gifford Pinchot National Forest, with its mountains, mineral hot springs, ancient lava beds, and, of course, Mount St. Helens.

Today, Skamania County's economy is based largely on federal employment--especially management of national forests and of fish and wildlife--with the balance distributed among logging and lumber, tourism and recreation, and light manufacturing.

Table 4: GENERAL PROFILE Skamania, WA

POPULATION AND HOUSING (Bureau of the Census)	
Total resident population:	
1995	**9,098**
Percent 65 years and over	**10.8**
1990	**8,289**
1980	**7,919**
Occupied housing units, 1990	**3,066**
Percent owner occupied	**73.5**
BIRTHS AND DEATHS (National Center for Health Statistics)	
Births, 1993	**96**
Per 1,000 resident population	**10.9**
Percent to mothers under 20 years of age	**9.4**
Deaths, 1993	**68**
Per 1,000 resident population	**7.8**
Infant deaths per 1,000 live births, 1993	**20.8**
EDUCATION (Bureau of the Census)	
Persons 25 years and over, 1990	**5,263**
Percent high school graduates	**77.4**
Percent college graduates	**11.7**
LABOR FORCE (Bureau of Labor Statistics)	
Civilian labor force, 1994	**3,987**
Percent unemployed	**10.0**
PRIVATE NONFARM ESTABLISHMENTS (Bureau of the Census)	
Total establishments, 1993	**151**
Percent retail trade	**19.2**
Percent services	**24.5**
Paid employees, 1993 (pay period including March 12)	**861**
Annual payroll, 1993 ($1,000)	**14,516**
PERSONAL INCOME (Bureau of Economic Analysis)	
Total personal income, 1993 ($1,000)	**156,978**
Per capita (dollars)	**17,873**
AGRICULTURE (Bureau of the Census)	
Number of farms, 1992	**60**
Land in farms as percent of total land	**0**
RETAIL TRADE (Bureau of the Census)	
Retail sales, 1992 ($1,000)	**12,077**

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    Per capita (dollars).....                1,412
COMMERCIAL AND SAVINGS BANKS (Fed. Deposit Insurance Corp.)
  Number of offices, June 30, 1994.....          2
    Total deposits ($1,000).....            22,340
SOCIAL PROGRAMS (Social Security Administration)
  Total Social Security recipients, December 1993.....   1,110
    Retired workers.....                       675
  Supplementary Security Income recipients, December 1994..   126
FEDERAL FUNDS AND GRANTS (Bureau of the Census)
  Total direct expenditures or obligations per capita:
    1994 (dollars).....                      3,595
    1990 (dollars).....                      2,918
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Source: U.S. Bureau of the Census, USA Counties 1996 CD-ROM.
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2.1.4 Gilliam County, Oregon

Gilliam County is in the heart of the Columbia Basin wheat area. The economy is based mainly on agriculture, with an average farm size of about 4,200 acres. Wheat, barley and beef cattle are the principal crops. The largest individual employers in the county are two subsidiaries of Waste Management Inc., Chemical Waste Management of the Northwest and Oregon Waste Systems, Inc., a regional state-of-the-art solid waste landfill.

With elevations of over 3,000 feet near Condon in the south of the county and 285 feet at Arlington, thirty-eight miles north, the county offers a variety of climates and atmosphere. Hunting, fishing and tourism are important secondary industries. Two major rivers, the John Day and Columbia, traverse the area, as well as Interstate 84. Highway 19 connects the county's major cities and serves as gateway to the John Day Valley.

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Table 5: GENERAL PROFILE Gilliam, OR
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POPULATION AND HOUSING (Bureau of the Census)
  Total resident population:
    1995.....                                1,861
      Percent 65 years and over.....          16.8
    1990.....                                1,717
    1980.....                                2,057
  Occupied housing units, 1990.....            696
    Percent owner occupied.....               66.7
BIRTHS AND DEATHS (National Center for Health Statistics)
  Births, 1993.....                             19
    Per 1,000 resident population.....        10.7
    Percent to mothers under 20 years of age.....   5.3
  Deaths, 1993.....                             18
    Per 1,000 resident population.....        10.1
  Infant deaths per 1,000 live births, 1993.....   0.0
EDUCATION (Bureau of the Census)
  Persons 25 years and over, 1990.....       1,184
    Percent high school graduates.....        85.4
    Percent college graduates.....            18.7
LABOR FORCE (Bureau of Labor Statistics)
  Civilian labor force, 1994.....            1,110
    Percent unemployed.....                    3.9
PRIVATE NONFARM ESTABLISHMENTS (Bureau of the Census)
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Total establishments, 1993	49
Percent retail trade	36.7
Percent services	10.2
Paid employees, 1993 (pay period including March 12)	467
Annual payroll, 1993 ($1,000)	9,808
PERSONAL INCOME (Bureau of Economic Analysis)	
Total personal income, 1993 ($1,000)	33,228
Per capita (dollars)	18,709
AGRICULTURE (Bureau of the Census)	
Number of farms, 1992	143
Land in farms as percent of total land	99
RETAIL TRADE (Bureau of the Census)	
Retail sales, 1992 ($1,000)	7,685
Per capita (dollars)	4,349
COMMERCIAL AND SAVINGS BANKS (Fed. Deposit Insurance Corp.)	
Number of offices, June 30, 1994	2
Total deposits ($1,000)	17,056
SOCIAL PROGRAMS (Social Security Administration)	
Total Social Security recipients, December 1993	420
Retired workers	285
Supplementary Security Income recipients, December 1994	29
FEDERAL FUNDS AND GRANTS (Bureau of the Census)	
Total direct expenditures or obligations per capita:	
1994 (dollars)	9,459
1990 (dollars)	8,887

Source: U.S. Bureau of the Census, USA Counties 1996 CD-ROM.

2.1.5 Hood River County, Oregon

Agriculture, timber, lumber and recreation are the major sources of revenue and industry in Hood River County. Fruit grown in the fertile valley is of such exceptional quality the county leads the world in Anjou pear production. There are more than 14,000 acres of commercial orchards growing pears, apples, cherries and peaches. Hood River County also has two ports and two boat basins, with one serving local barge traffic, a steel boat manufacturing firm and Mid-Columbia yachting interests. Windsurfing on the Columbia River is a popular sport and attracts windsurfers from all over the world.

Table 6: GENERAL PROFILE Hood River, OR

POPULATION AND HOUSING (Bureau of the Census)	
Total resident population:	
1995	18,589
Percent 65 years and over	13.7
1990	16,903
1980	15,835
Occupied housing units, 1990	6,425
Percent owner occupied	62.1
BIRTHS AND DEATHS (National Center for Health Statistics)	
Births, 1993	291
Per 1,000 resident population	16.4
Percent to mothers under 20 years of age	10.0
Deaths, 1993	163
Per 1,000 resident population	9.2

Infant deaths per 1,000 live births, 1993	10.3
EDUCATION (Bureau of the Census)	
Persons 25 years and over, 1990	11,008
Percent high school graduates	71.3
Percent college graduates	18.0
LABOR FORCE (Bureau of Labor Statistics)	
Civilian labor force, 1994	10,041
Percent unemployed	7.6
PRIVATE NONFARM ESTABLISHMENTS (Bureau of the Census)	
Total establishments, 1993	654
Percent retail trade	25.2
Percent services	33.5
Paid employees, 1993 (pay period including March 12)	7,069
Annual payroll, 1993 ($1,000)	119,177
PERSONAL INCOME (Bureau of Economic Analysis)	
Total personal income, 1993 ($1,000)	304,323
Per capita (dollars)	17,181
AGRICULTURE (Bureau of the Census)	
Number of farms, 1992	563
Land in farms as percent of total land	8
RETAIL TRADE (Bureau of the Census)	
Retail sales, 1992 ($1,000)	121,979
Per capita (dollars)	7,040
COMMERCIAL AND SAVINGS BANKS (Fed. Deposit Insurance Corp.)	
Number of offices, June 30, 1994	8
Total deposits ($1,000)	138,341
SOCIAL PROGRAMS (Social Security Administration)	
Total Social Security recipients, December 1993	3,080
Retired workers	2,170
Supplementary Security Income recipients, December 1994	185
FEDERAL FUNDS AND GRANTS (Bureau of the Census)	
Total direct expenditures or obligations per capita:	
1994 (dollars)	4,487
1990 (dollars)	5,261

Source: U.S. Bureau of the Census, USA Counties 1996 CD-ROM.

2.1.6 Morrow County, Oregon

Morrow County contains more than one million acres of gently rolling plains and broad plateaus. This rich agricultural land can be roughly divided into three occupational zones--increasing amounts of irrigation farming in the north; vast fields of wheat yielding to cattle and sheep ranches in the center; and timber products in the south. Food processing and recreation are also important sectors. With the advent of center pivot irrigation technology, Morrow County became one of Oregon's fastest growing areas in terms of population, personal income, and agricultural and industrial development. The Port of Morrow serves as a gateway to Pacific Northwest and Pacific Rim markets.

Table 7: GENERAL PROFILE Morrow, OR

POPULATION AND HOUSING (Bureau of the Census)	
Total resident population:	
1995	8,922
Percent 65 years and over	12.9

1990	7,625
1980	7,519
Occupied housing units, 1990	2,803
Percent owner occupied	68.0
BIRTHS AND DEATHS (National Center for Health Statistics)	
Births, 1993	131
Per 1,000 resident population	15.4
Percent to mothers under 20 years of age	19.1
Deaths, 1993	57
Per 1,000 resident population	6.7
Infant deaths per 1,000 live births, 1993	7.6
EDUCATION (Bureau of the Census)	
Persons 25 years and over, 1990	4,731
Percent high school graduates	73.9
Percent college graduates	11.8
LABOR FORCE (Bureau of Labor Statistics)	
Civilian labor force, 1994	3,812
Percent unemployed	8.2
PRIVATE NONFARM ESTABLISHMENTS (Bureau of the Census)	
Total establishments, 1993	142
Percent retail trade	26.8
Percent services	19.0
Paid employees, 1993 (pay period including March 12)	1,550
Annual payroll, 1993 ($1,000)	35,548
PERSONAL INCOME (Bureau of Economic Analysis)	
Total personal income, 1993 ($1,000)	142,704
Per capita (dollars)	16,759
AGRICULTURE (Bureau of the Census)	
Number of farms, 1992	348
Land in farms as percent of total land	86
RETAIL TRADE (Bureau of the Census)	
Retail sales, 1992 ($1,000)	19,565
Per capita (dollars)	2,404
COMMERCIAL AND SAVINGS BANKS (Fed. Deposit Insurance Corp.)	
Number of offices, June 30, 1994	4
Total deposits ($1,000)	48,229
SOCIAL PROGRAMS (Social Security Administration)	
Total Social Security recipients, December 1993	1,415
Retired workers	885
Supplementary Security Income recipients, December 1994	86
FEDERAL FUNDS AND GRANTS (Bureau of the Census)	
Total direct expenditures or obligations per capita:	
1994 (dollars)	4,608
1990 (dollars)	3,849

Source: U.S. Bureau of the Census, USA Counties 1996 CD-ROM.

2.1.7 Sherman County, Oregon

The county is a wheat-growing area with miles of waving grain on rolling hills of wind-blown glacial silt. The total absence of timber in the county exemplifies the true meaning of the "wide open spaces of the West." Its pastoral landscape has spectacular views of canyons and rivers with mountains silhouetted in the distance. Recreation abounds on the rivers, from the famous and scenic fly-fishing and whitewater rafting stream of the Deschutes to water-skiing, wind-surfing, boating, fishing and rafting on the John Day and Columbia Rivers.

Table 8: GENERAL PROFILE Sherman, OR

POPULATION AND HOUSING (Bureau of the Census)	
Total resident population:	
1995	1,886
Percent 65 years and over	20.4
1990	1,918
1980	2,172
Occupied housing units, 1990	784
Percent owner occupied	66.1
BIRTHS AND DEATHS (National Center for Health Statistics)	
Births, 1993	20
Per 1,000 resident population	10.4
Percent to mothers under 20 years of age	5.0
Deaths, 1993	23
Per 1,000 resident population	12.0
Infant deaths per 1,000 live births, 1993	0.0
EDUCATION (Bureau of the Census)	
Persons 25 years and over, 1990	1,311
Percent high school graduates	83.1
Percent college graduates	18.9
LABOR FORCE (Bureau of Labor Statistics)	
Civilian labor force, 1994	1,035
Percent unemployed	6.5
PRIVATE NONFARM ESTABLISHMENTS (Bureau of the Census)	
Total establishments, 1993	39
Percent retail trade	38.5
Percent services	20.5
Paid employees, 1993 (pay period including March 12)	212
Annual payroll, 1993 ($1,000)	2,834
PERSONAL INCOME (Bureau of Economic Analysis)	
Total personal income, 1993 ($1,000)	45,963
Per capita (dollars)	23,939
AGRICULTURE (Bureau of the Census)	
Number of farms, 1992	179
Land in farms as percent of total land	93
RETAIL TRADE (Bureau of the Census)	
Retail sales, 1992 ($1,000)	11,471
Per capita (dollars)	6,022
COMMERCIAL AND SAVINGS BANKS (Fed. Deposit Insurance Corp.)	
Number of offices, June 30, 1994	1
Total deposits ($1,000)	7,468
SOCIAL PROGRAMS (Social Security Administration)	
Total Social Security recipients, December 1993	435
Retired workers	280
Supplementary Security Income recipients, December 1994	29
FEDERAL FUNDS AND GRANTS (Bureau of the Census)	
Total direct expenditures or obligations per capita:	
1994 (dollars)	10,702
1990 (dollars)	8,285

Source: U.S. Bureau of the Census, USA Counties 1996 CD-ROM.

2.1.8 Umatilla County, Oregon

Water in the form of irrigation has been key to economic diversification and growth, most recently in the Hermiston area, where the desert now yields lush watermelons and other products. Tourism is also increasingly important to Umatilla County, noted for the Pendleton Round-up. In addition to agriculture and tourism, food processing, forest products, manufacturing, recreation, aggregate production and power generation are important components of the economy.

Table 9: GENERAL PROFILE Umatilla, OR

POPULATION AND HOUSING (Bureau of the Census)	
Total resident population:	
1995	**64,040**
Percent 65 years and over	**13.3**
1990	**59,249**
1980	**58,861**
Occupied housing units, 1990	**22,020**
Percent owner occupied	**62.0**
BIRTHS AND DEATHS (National Center for Health Statistics)	
Births, 1993	**1,021**
Per 1,000 resident population	**16.4**
Percent to mothers under 20 years of age	**15.3**
Deaths, 1993	**589**
Per 1,000 resident population	**9.5**
Infant deaths per 1,000 live births, 1993	**4.9**
EDUCATION (Bureau of the Census)	
Persons 25 years and over, 1990	**37,316**
Percent high school graduates	**75.1**
Percent college graduates	**13.3**
LABOR FORCE (Bureau of Labor Statistics)	
Civilian labor force, 1994	**31,991**
Percent unemployed	**6.8**
PRIVATE NONFARM ESTABLISHMENTS (Bureau of the Census)	
Total establishments, 1993	**1,478**
Percent retail trade	**27.8**
Percent services	**32.3**
Paid employees, 1993 (pay period including March 12)	**15,453**
Annual payroll, 1993 ($1,000)	**286,559**
PERSONAL INCOME (Bureau of Economic Analysis)	
Total personal income, 1993 ($1,000)	**1,019,604**
Per capita (dollars)	**16,368**
AGRICULTURE (Bureau of the Census)	
Number of farms, 1992	**1,441**
Land in farms as percent of total land	**71**
RETAIL TRADE (Bureau of the Census)	
Retail sales, 1992 ($1,000)	**424,123**
Per capita (dollars)	**6,927**
COMMERCIAL AND SAVINGS BANKS (Fed. Deposit Insurance Corp.)	
Number of offices, June 30, 1994	**20**
Total deposits ($1,000)	**458,314**
SOCIAL PROGRAMS (Social Security Administration)	
Total Social Security recipients, December 1993	**10,870**
Retired workers	**7,065**
Supplementary Security Income recipients, December 1994	**1,116**

FEDERAL FUNDS AND GRANTS (Bureau of the Census)	
Total direct expenditures or obligations per capita:	
1994 (dollars)	**4,154**
1990 (dollars)	**3,147**

Source: U.S. Bureau of the Census, USA Counties 1996 CD-ROM.

2.1.9 Wasco County, Oregon

The county economy is largely oriented toward agriculture, forest products, manufacturing, electric power, aluminum and transportation.

Table 10: GENERAL PROFILE Wasco, OR

POPULATION AND HOUSING (Bureau of the Census)	
Total resident population:	
1995	**22,737**
Percent 65 years and over	**17.1**
1990	**21,683**
1980	**21,732**
Occupied housing units, 1990	**8,607**
Percent owner occupied	**65.1**
BIRTHS AND DEATHS (National Center for Health Statistics)	
Births, 1993	**270**
Per 1,000 resident population	**12.1**
Percent to mothers under 20 years of age	**12.6**
Deaths, 1993	**284**
Per 1,000 resident population	**12.7**
Infant deaths per 1,000 live births, 1993	**14.8**
EDUCATION (Bureau of the Census)	
Persons 25 years and over, 1990	**14,484**
Percent high school graduates	**77.4**
Percent college graduates	**14.5**
LABOR FORCE (Bureau of Labor Statistics)	
Civilian labor force, 1994	**11,335**
Percent unemployed	**7.0**
PRIVATE NONFARM ESTABLISHMENTS (Bureau of the Census)	
Total establishments, 1993	**620**
Percent retail trade	**29.2**
Percent services	**33.1**
Paid employees, 1993 (pay period including March 12)	**5,780**
Annual payroll, 1993 ($1,000)	**104,484**
PERSONAL INCOME (Bureau of Economic Analysis)	
Total personal income, 1993 ($1,000)	**395,825**
Per capita (dollars)	**17,749**
AGRICULTURE (Bureau of the Census)	
Number of farms, 1992	**456**
Land in farms as percent of total land	**76**
RETAIL TRADE (Bureau of the Census)	
Retail sales, 1992 ($1,000)	**229,178**
Per capita (dollars)	**10,266**
COMMERCIAL AND SAVINGS BANKS (Fed. Deposit Insurance Corp.)	
Number of offices, June 30, 1994	**8**
Total deposits ($1,000)	**208,772**
SOCIAL PROGRAMS (Social Security Administration)	

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  Total Social Security recipients, December 1993.....          4,685
    Retired workers.....                                         3,115
  Supplementary Security Income recipients, December 1994..        340
FEDERAL FUNDS AND GRANTS (Bureau of the Census)
  Total direct expenditures or obligations per capita:
    1994 (dollars).....                                          4,205
    1990 (dollars).....                                          3,384
-------------------------------------------------------------------------
Source: U.S. Bureau of the Census, USA Counties 1996 CD-ROM.
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2.2 SOCIO-DEMOGRAPHIC CHARACTERISTICS

Many of the counties described above are sparsely populated. The heavy reliance on agriculture tends to generate higher levels of unemployment, due to the its seasonal nature, and lower average earnings. This can be seen clearly in Table 11, where the median income for Benton County, with Hanford and related activities, is almost fifty percent higher than the other counties in the region. Poverty rates vary substantially from a low of seven percent in Gillium to a high of over eighteen percent in Franklin. Childhood poverty rates are correlated with the overall poverty rates but always at a higher level.

Table 11: Poverty and Income Estimates for 1995

	Poverty, All Ages	Percent of Population All Ages	Poverty, Under Age 18	Percent of Population Under 18	Median Household Income
Benton, WA	11,840	8.7	5,019	12.0	45,696
Franklin, WA	8,514	18.6	4,033	24.4	32,261
Klickitat, WA	2,984	16.0	1,219	22.1	31,004
Skamania, WA	1,002	10.7	368	13.4	35,444
Gillium, OR	147	7.4	48	9.2	33,403
Hood River, OR	2,955	15.2	1,034	19.1	31,349
Morrow, OR	773	8.3	282	9.9	30,677
Sherman, OR	215	11.6	69	13.7	29,434
Umatilla, OR	10,813	17.0	3,936	21.5	29,365
Wasco, OR	3,086	13.3	1,115	18.0	31,937

Source: U.S. Bureau of the Census, Small Area Income and Poverty Estimates Program

Table 12 shows that the largest minority group in the area is Hispanics, with all but two of the Oregon Counties having a higher percentage than the state as a whole. Hispanics make up over twenty-two percent of the population in Hood River County, Oregon. The next largest group is American Indians, where the small percentages are generally above the percentages for the state as a whole. The percentage of Blacks is well below the low percentage for the state as whole, and two of the counties showed essentially zero Black population. The percentage of Asians is not shown, but is also low. The female percentage of the labor force is lower than the state average in each of the Oregon counties.

Table 12: Percent of Civilian Labor Force by Race and Gender 1997

	Total Minority	**Black, Not Hispanic**	**Am. Ind. Not Hispanic**	**Hispanic All Races**	**Female**
State of Oregon	11.1%	1.5%	1.2%	5.5%	44.8%
Gillium, OR	5.4%	0.3%	0.3%	4.4%	43.9%
Hood River, OR	26.3%	0.4%	1.5%	22.6%	40.1%
Morrow, OR	16.5%	0.0%	1.1%	15.1%	40.3%
Sherman, OR	4.9%	0.0%	0.8%	4.1%	39.6%
Umatilla, OR	16.3%	0.1%	2.8%	12.3%	43.8%
Wasco, OR	11.4%	0.4%	3.1%	6.8%	43.6%

Source: Oregon Employment Department

3.0 SOCIAL IMPACTS

There are a variety of social impacts that may arise as a result of changes in the use of the Columbia. These are often discussed in terms of the overall impact on employment and other economic indicators; but it is important to remember that the aggregate totals conceal many important details. First, aggregate totals are often long-run effects, but there are likely to be important distinctions between the short run and the long run and the transition periods. Second, aggregate effects often mask interpersonal or geographic differences in impact. Thus, a net increase in jobs may not mean much to someone without the appropriate skills for the jobs created while a net decrease in jobs may mask a substantial increase in employment opportunities for some. While it is often much more difficult to determine the detail of economic and social impacts, some discussion of likely trends may help to focus on the distribution of the impacts.

Related impacts occur through the process of capitalization of various economic values into land prices. Through the process of capitalization, the person owning the land at the time of an economic change actually bears much of the burden or receives much of the benefit of the changes even though the impact is spread over many years. A simple example may help clarify this effect. Suppose that the cost of irrigating an acre of land were to increase by $10 per year relative to current prices, and suppose that current crop practices would remain the best option for the land even at the higher cost of irrigation. It might seem that a current farmer could avoid the future costs by selling the land, but economic analysis shows that this is usually not possible. In simple terms, the net profit from each acre of land has been reduced by $10 per year relative to what it otherwise would be. If ten percent were the appropriate interest rate for evaluating farm investments, then the value of the land would be expected to immediately drop by $100, or ten times the increased cost. The market price of the land is based on its expected profitability over time, and with the increased cost, this has declined by $10 per year. At ten-percent interest, an investor would have to put aside $100 to get $10 per year in interest. Hence, anyone interested in purchasing the land would reduce his or her offer by $100. So, the person owning the land at the time of the change receives most of the impact whether that person continues to own the land or not. This reduction may also be viewed as a decrease in allowable spending by households who receive current or future rents from these assets.

Capitalization occurs with both positive and negative impacts. Thus, increased recreational opportunities may cause the value of land near the recreation site to increase by some multiple of the expected annual value of increased recreation opportunities. While capitalization is seldom as efficient or complete as this discussion implies, it is important to take it into account when trying to determine the distribution of benefits and costs.

3.1 REGIONAL IMPACTS

The aggregate region wide effects of breaching are likely to be quite small, but several issues may be worth considering. First, breaching may affect the ability to maintain the shipping

channel downriver. While the John Day is not used largely for storage, there has been some mention of the possibility that the combined effect of the changes under consideration would influence the ability to maintain the navigation channel up to the Port of Portland. Problems with this would have a direct negative effect on the Port of Portland and its shippers, while it may have a positive impact on other ports and shipment modes. Even if the shipping channel is not affected, changes in the ability to ship products by barge may affect the relative attractiveness of various ports for products, primarily agricultural products, destined for foreign markets. In particular, elimination of barge traffic to the Tri-Cities would have important implications for agricultural transportation in both eastern Oregon and eastern Washington. A switch to railroad shipping may make other ports, such as Tacoma and Seattle more attractive as a final destination. Refined analysis of the likely transportation impacts would be necessary to determine the employment and economic effects of such changes.

Second, reduced electric generation is likely to result in higher regional energy prices and construction of other sources of energy supply. This would probably be a much smaller impact than it might have been in the past due to the improved technology for gas turbine generation and the projections of stable natural gas prices. Before the improvements in turbine technology the replacement energy would most likely have come from large thermal plants that are more costly and have a larger environmental impact. The likely location of these plants is an important consideration. Both the construction and operation will generate economic activity, but the newer plants can be built at much smaller scale than the old ones. Hence, they are likely to be distributed over a wide geographic area. The higher energy prices are likely to be a relatively minor effect, but they may impact disproportionately on industries, particularly aluminum production, that are energy intensive and on homeowners who rely on electric heat. Certain utilities are likely to be affected more than others, and customers of these utilities who are heavy users of electricity may see significant impacts. Further, the future cost becomes more uncertain due to the potential variability in gas price. Power produced using gas appears to have a much higher potential for both net cost increase and for cost variation than hydropower.

Recreation changes will have direct employment impacts in the area affected but many of the people who will either benefit from new recreation opportunities or lose from the loss of old ones are located in other parts of the state and even the country. Many people argue that the recreation opportunities available in the Northwest are an important amenity, but it would be difficult to quantify the value of such changes or their distribution among the population.

3.2 BASE CASE

The base case is assumed to be the retention of all dams on the Snake River and the continuation of current operation of the McNary and John Day dams. This case should be analyzed in some detail to provide a good comparison with the alternatives to be considered. Several factors are worth highlighting. First, the reliance on agriculture in the region makes the economy subject to fairly substantial risks and volatility under the best of circumstances. The Oregon Employment Department reported that sales of grain in the state were estimated to have fallen from $268 million in 1997 to $184 million in 1998. “The North Central District (Gilliam, Hood River, Morrow, Sherman, Umatilla, Wasco, and Wheeler counties), which accounts for roughly 75 percent of the state’s grain production, also accounted for the brunt of the sales losses.” (State of

Oregon Employment Department, "Mid-Columbia Labor Trends," July 1999, page 1). Clearly, the region is subject to high variance in prices and earnings for agriculture.

Second, a variety of mitigation measures are likely to be imposed to improve conditions for salmon, and some of these measures could impact on farm practices and costs. Since some of the mitigation measures may not be necessary if other actions are taken, the cost and impact of such measures should be analyzed as part of the base case for comparison purposes.

Third, electric power costs may be affected by various changes in the electric power industry. Currently, the cost of generating hydropower is below its market value. This allows for the sale of some power at preferential prices. Recipients of this power would be made worse off by an increase in their costs, but the level and distribution of these benefits is subject to uncertainty in the face of changes in the electric power market. Retention of such preferentially priced power may not be the most appropriate base case.

3.3 ALTERNATIVES

The alternatives are operation of John Day at spillway crest or at natural river. However, some of the social impacts are affected by the decisions made regarding the Snake River dam operations. Hence, for part of the analysis, four cases are considered. The first is operation of John Day at spillway crest with no change in the Snake River nor McNary dams. The second is operation at spillway crest with natural river for the Snake River dams and operation of McNary adjusted to accommodate these changes. The third is operation of John Day at natural river with no change in the Snake River nor McNary dams. The fourth is natural river for both the John Day dam and the Snake River dams with operation of McNary adjusted to accommodate these changes.

Impact of natural river for the Snake River dams on the Upriver and Reservoir areas has been completed as part of the Snake River analysis.. The navigation impact of a John Day drawdown would impact the Lower Snake River region. The scenarios related to that study assume the majority of grain would move from the Tri-Cities to Portland by barge, and the decisions made regarding the John Day operation affect the feasibility of barge operations.Other than navigation, changes in the operation of the John Day are not likely to have substantial impacts on these regions. Hence, the analysis is focused on the Downriver area. The construction costs of these actions have been estimated at $530 million for the Snake River dams and up to $1 billion for John Day. Other costs would depend on the actions taken.

3.4 SOCIAL IMPACTS

Social impacts are subject to great uncertainty, especially where the issue of financing is not resolved. From the regional perspective, income is income, whether it comes from the sale of agricultural commodities or from federal payments for construction activity. Hence, the regional social impact analysis does not focus on the net benefits or costs of activities. Rather, it focuses on whether the local communities are made better or worse off. However, some activities may be financed from a variety of sources, including local ones. Then the source of the funds becomes an important issue. From the local perspective, federal funds generate only benefits

while local funds generate benefits and costs. This is true whether the local funds are raised through local governments, e.g., taxes paid for an improved municipal water system, or through private sources, e.g., higher irrigation costs. A variety of such issues are unresolved and will have a substantial effect on the ultimate impacts. Further, where there are likely to be negative local impacts, the potential levels of federal intervention become relevant. From an economic perspective, such issues often have little impact on the net economic outcome, but from a social perspective, they may be decisive in determining the impact. Where differences in the source of funding are clearly defined, they will be noted, but there are many areas where future decisions may substantially alter the impacts.

3.4.1 Water Supplies

Lowering the John Day to either spillway crest or natural river will raise the cost of drawing water for irrigation, municipal water uses, and some industrial water uses. In general, it is expected that the cost of responding to such changes in operation will involve a capital cost to relocate water intake and a higher operating cost associated with pumping water. For reduction to spillway crest, it may be relatively easy to make such adjustments, but reduction to natural river is likely to have much more substantial costs. For reduction to natural river, two options have been presented for analysis. The first is to simply allow each user to move the intake source and absorb the higher pumping costs. The initial cost is expected to be around $239 million to move the pump intakes. The second is to construct canals on both sides of the river to provide water for irrigation purposes. This is estimated to cost $375 million.

The initial cost of the canals is higher than the initial cost of relocating intake, but the operating costs for the latter would be higher. In addition, there is concern that relocating intakes would cause the loss of a growing season. This would result in loss of net revenue for farmers with annual crops, but it could result in the loss of major investments in the case of perennial crops. In the latter case, it typically would take a number of years to re-establish the crops. The analysis for municipal and industrial use does not consider transition costs, although there may be some in this case as well.

Changes in the cost and availability of water would be expected to impact on both the value of farmland and the viability of farming. The farmer may simply absorb an increase in the cost of irrigation or it may lead to changes in crops or farming practices. This in turn would affect employment in farming if crops are changed or if farming proves to be less viable. In particular, much of the approximately 180,000 acres being irrigated is found in high-value crops such as apples. The additional cost of annual irrigation does not seem large enough to result in abandonment of such enterprises; however, loss of orchards could have this impact. In particular, it could effectively bankrupt some farmers. Additional analysis is needed to determine if there are alternative methods to preserve perennial crops during a transition period as well as the cost of such alternatives. Alternative sources of water for high-valued crops, such as drilling wells, also should be analyzed.

The type of response to the changes in the operation of the John Day dam are likely to have an important effect on the farmers in the region. Most current irrigation is privately provided, taking advantage of the John Day pool. Unless costs are distributed over a wider base (ie. Federal or state taxpayers), the full cost of relocating pump intakes, increased annual operating

cost, and lost crops, would be borne by farmers. In this case, it is possible that many farmers would go out of business due to the costs imposed. This might occur even if the farm remained viable since some farmers might be forced into bankruptcy. This would be a particular issue for small farms with limited financial options. Because a farmer may go out of business does not mean that production would cease. Another farmer may buy the land with the production potential at a rate below the cost of existing improvements. At the lower cost, the new farmer may be able to invest in a variety of water deliver systems.

3.4.2 Power

Changes in operation of any of the dams in question will result in reduced production of electricity. Bonneville Power estimates that breaching of the Snake River dams would result in the loss of 1,231 average megawatts of power. John Day has a peaking capacity of 2,484 megawatts and annually generates an average of 1,146 average megawatts. John Day at spillway would lose 551 average megawatts of generation, and would lose all generating capacity at natural river. The project at natural river or spillway level wiould lose its flexibility to follow shifts in demand and provide reserve capacity. The power analysis identified likely replacement generation resources and the additional costs associated with replacing lost hydropower with more costly types of generation. The study also identified what type of improvements would be needed in the Pacific Northwest transmission system to assure a safe and reliable power system with the John Day drawdown alternatives.With the higher cost of alternative sources, power prices are expected to rise, although the distribution of these costs will depend to some extent on how existing power sales are treated. The marginal cost of production for hydropower is below the market value, and some is sold at preferential rates. The impact of the higher cost for replacement power will depend on a variety of factors, but average impacts have been estimated. The impact on average energy prices is expected to be small. Preliminary analysis indicates that replacement power plants are likely to be built within the region to take advantage of the power distribution network. However, gas turbine plants have a smaller optimal size than many existing thermal-power generating facilities and tend to have less environmental impact. This may lead to a more decentralized distribution of the construction, with some or all of the plants being constructed closer to markets.

Increased power costs are not likely to have much impact on individuals in the region, but they may affect some heavy power users, particularly the aluminum industry, food processors, and irrigation with high lifts. While most analyses discount the potential for increased power costs to affect industry operations, the jobs in these industries tend to be relatively high pay. Hence, any loss in such jobs would have an impact not only on the overall level of employment but also on the wage distribution. Since these areas are not typically good locations for most types of industrial activity, other employment opportunities would not be likely to offset the jobs lost. Hence, if such job losses did occur, they would likely result in either movement of workers out of the area or re-employment at lower wages. Further, substantial employment losses in primary industries would create ripple effects on the regional economy.

The jobs in the power industry itself are likely to be approximately unchanged on net. The loss of jobs in hydropower would be offset by the expected gain from alternative power generation. Thus, if the alternative sources are built in this region, there would be a transitional effect as the hydropower jobs are eliminated and other plants are opened, but the net change does not appear

large and the wage structures are likely to be similar. However, if the new facilities are not built and operated within the region, there would be a net loss of jobs in the power industry, a relatively high paying sector.

3.4.3 Anadromous Fish

All options are expected to increase natural fish runs to varying extents. This would apply to all species above the dam, although the full impact might take as long as fifty years for some species. This may result in increased harvests, generating income and employment in commercial fishing and processing throughout the Pacific Northwest. The net impact is uncertain both due to scientific information and policy information. A variety of policies, such as hatchery operations, would affect the net impact on fish runs. There are also other mitigation measures that may affect survival rates, and it is not known if changes in dam operation would make these other measures unnecessary or not.

3.4.4 Recreation

Many of the recreation opportunities in the area are associated with slack water access. Drawdown to spillway crest is likely to result in a reduction of recreation opportunities by limiting the area of slack water for boating and fishing (assuming mitigation of recreation facilities). The reduction in area will also limit the habitat and productive capacity of the pool for resident fish resulting in losses of recreational fishing activity. A temporary impact with drawdown to spillway crest will be a reduction in aesthetics as the shorelines recover over time. With drawdown to natural river level, aesthetics are expected to be impacted in the short term but improve over the long term. Recreation activity will shift from slack water-oriented boating and fishing activities such as skiing, windsurfing, and boat fishing to a different range of activities applicable to natural river conditions. Fishing for anadromous fish will improve in the area, while fishing for resident fish will decline. High-valued recreation activities like whitewater rafting are not likely to occur at John Day with natural river drawdown due to river flow conditions. Due to the high level of current slack water recreation at the John Day pool, it is expected that there will be a slight decline in recreation benefits with natural river drawdown and a more pronounced loss of benefits with the drawdown to spillway crest alternative. However, more of the visitors attracted are expected to be from outside the local area. This has the effect of increasing the impacts on the local economy through gains in household income and jobs even though total visitors will be fewer.

Employment losses are expected in the short run due to loss in recreation opportunities. These may be offset in the long run as alternative recreation activities are developed and if increases in fish populations provide additional opportunities. Small businesses that rely on users of the recreation facilities may also face reduced patronage. Some may go out of business if the recreation users are a prime source of customers. While these may be offset by employment gains in the long run, there is likely to be a transition period that creates difficulties for existing businesses. In general, the job losses are likely to be in the service sector, and the anticipated growth in service sector employment should mitigate any adverse effects on employment. The most likely negative impacts would be on specific businesses.

3.4.5 Navigation

Breaching of the dams on the lower Snake River would cause some shifting of transportation for agricultural commodities, but it is not expected to have a large impact on net transportation rates. However, combining this with either option on the John Day is likely to result in substantial changes in transportation choices. A major issue is the economic feasibility of using railroads for this traffic at current rates. Agricultural shipping tends to be somewhat seasonal, and dedication of rail cars for grain shipment is not a high priority for Class I railroads. Due to the truck-barge competition, substantial amounts of rail line has been abandoned in this area, and the State of Washington has subsidized purchase of rail cars to help maintain rail car grain shipments from eastern Washington. This implies that increased reliance on rail may also lead to higher prices. On the other hand, higher volumes of grain shipment by rail may reduce the net cost. This issue requires further analysis.

3.4.6 Construction

Activities such as breaching would generate a substantial amount of construction employment. In addition, many of the actions likely to be taken in response to breaching would also result in construction activity. For example, replacement power plants might have to be constructed or roads and railroads improved. It is generally expected that there would be a substantial increase in construction activity in the short run, and that this would provide a significant economic boost to the region during the construction period. However, the end of the construction period would result in negative local effects as the employment and other activities were withdrawn.

3.5 URBAN AND COMMUNITY IMPACTS

3.5.1 Income Distribution

The net impact of breaching is likely to have some effects on income distribution. In the short run, the increase in construction jobs and likely decrease in recreation and possibly agricultural jobs will favor skilled workers over unskilled workers. This may have an adverse effect on the distribution of income if few of the workers who lose jobs are able to find employment in construction. Alternatively, if the displaced workers can get employment in construction, it is likely to improve the income distribution due to the higher average wages in constructions.

Owners of farmland are likely to be made worse off due to the higher cost of farming. They may be made much worse off if the changes force them to change farming practices drastically. For example, if the cost of irrigation makes fruit trees untenable, the farmer loses the investment in creating the orchard in the first place. Business owners may be made better or worse off depending on their activities and source of customers. Some businesses relying on recreation activities are likely to be made worse off, while those that work in the construction area are likely to be better off, at least in the short run.

When viewed from the regional perspective, the short-run impact is likely to be positive due largely to the increase in construction activity. Whether such jobs are filled by local residents or by “commuters” the effect is likely to be an increase in average income. The increased purchases of construction materials and other construction related expenses would impact

favorably on many local businesses. Offsetting this to some extent would be a loss for farm related businesses. While farm activity may not be impacted in the long run, there are a variety of reasons why farmers would be more cautious about their activities in the short run. Small businesses that focus on recreation would also experience a negative impact.

In the long run, the loss of construction activity could create a substantial negative impact if it were to occur over a short period of time. However, if the activity tapers off over a long period, the loss would not be as noticeable. Nevertheless, the long run effect would likely be a net job loss relative to what otherwise would have been the case. It is important to keep the time trend in mind when evaluating these changes. A concentration of job losses in the short run would have a much more negative impact than similar losses spread over a long period of time, especially when the time trend is for employment gains. Over time, the region would likely have a lower level of employment after the changes in dam operation than would have occurred without such changes, but this may not result in an actual reduction in employment if the changes take place over a long enough time period. An important issue is how much of the projected employment growth would be associated with expansion of agriculture and whether such expansions would be forestalled.

In looking at the net effect over time, much of the projected employment growth is in the service area. However, service employment is still dependent on a healthy economy. Reductions in projected employment levels for other sectors would have a compound effect on the service sector. In particular, this relationship could result in a typical boom-bust economic impact if the construction activity starts and ends abruptly.

3.5.2 Employment Distribution

In the short run, the employment changes are likely to favor skilled over unskilled workers. This may be a particular loss for agricultural workers. The share of minorities in the affected communities is greatest for Hispanics and above average for American Indians. Hispanics are most likely to be negatively affected by the loss of agricultural jobs and their relatively low representation in the skilled trade categories. In 1990, twenty percent of employed Hispanics in Oregon were in farming, forestry and fishing occupations. This represents a much higher concentration in these occupations than for other ethnic groups. Associated with this concentration is a per capita income that was only a little over half of that for all Oregonians. (Oregon Employment Department, "Hispanics In Oregon's Work Force" 1998, page 5). While these relative positions have changed since then, it seems safe to assume that losses in agricultural jobs would disproportionately affect Hispanic workers. Further, high dropout rates and low skills relative to the rest of the labor force (p. 24) make it less likely that Hispanics would be eligible for the jobs created in construction and other areas.

American Indians may receive positive impacts in the long run as fish runs return, but there do not appear to be any obvious short-run effects on employment or income opportunities for this group. The long run benefits of the improved fish runs would be cultural, subsistence, and commercial for this group. Salmon fishing has an important cultural benefit for many Indian tribes. In addition it provides direct food benefits and part of the catch may be sold commercially, providing income.

Women may also be at a relative employment disadvantage due to historical low participation in construction activities.

3.5.3 Population Distribution and Composition

The changes associated with breaching are likely to affect location patterns by making dispersed employment opportunities associated with agriculture and recreation less available and concentrating more of the employment activity in specific areas. In particular, substantial amount of construction activity would occur around any dams that are to be breached, and breaching of the John Day dam would affect the communities in that area. The loss in dispersed areas would depend on the overall effect on agriculture. Higher transportation, power, and irrigation costs would likely reduce employment related to agriculture over dispersed areas. To the extent that farming activity is not disrupted, the changes will be associated with a gain for growing areas but not necessarily at the expense of other areas in the region. Rather the gain is likely to be associated with net migration into the region in response to employment opportunities.

Changes in economic factors will create incentives for migration in response to employment and business opportunities. Sudden changes tend to affect demographic composition. For example, younger workers are likely to be more mobile than older workers. This affects the demographic composition of growing and declining areas. Loss of economic opportunity tends to result in young people moving out of an area, and this could be a particular issue for farm families. On the other hand, growing areas, with good employment opportunities are particularly attractive to such workers. The likely effect would be neutral for small rural farming communities and positive for the areas of concentrated economic activity. However, if there is a substantial loss in farm income and employment, then the demographic effects would also be negative. Younger, more mobile workers would tend to leave first, with a resulting concentration of older, less mobile population seen in other declining areas.

3.5.4 Fiscal Condition of State and Local Governments

State governments are not likely to see noticeable effects in terms of their income and expenditures. The impact on state economic activity is likely to be quite small relative to the overall state economies.

The effect of changes in local activity on local government revenue and expenditure are likely to differ between Oregon and Washington. Traditionally, local governments relied on property taxes for most of their locally generated revenue, and changes in property taxes were an important fiscal issue. This has been changed in Oregon for two reasons. First, local schools, the largest user of property tax revenue for most local governments, are no longer reliant on property taxes in Oregon. While local school districts do collect property taxes, the State determines the level of school expenditure and adjusts state contributions to offset changes in property tax revenue. Hence, an important source of local fiscal impact is drastically curtailed by the financing mechanism in Oregon. Second, the Oregon property tax system is based on an assessed value that is considerably below market value for most property in Oregon. While assessed value can not increase beyond market value, it can grow by three percent per year so long as it is below market value. Hence, even for general government in Oregon, a decrease in

property values may not result in any loss of tax revenue, so long as the market value does not decline below the assessed value. On the other hand, since the drawdown would not occur for some time, market values may be above assessed values or other changes in the financing system may have occurred.

In Washington, changes in assessed value would have a more direct impact on local government finance, but these impacts would not be large unless there were substantial changes in economic activity. Most of the projected impacts appear to be either neutral or positive in the short-run for most local governments. The exception would be largely rural areas where the decline in value for agricultural land might have a noticeable impact.

Local impacts can be expected to be varied. Some communities, especially those near construction sites, should see increases in activity. This would be expected to generate increases in revenue, although it may also create increases in demand for services. If population growth is rapid, then costly infrastructure improvements and personnel expansions may be necessary. However, if the increases in activity are moderate, then the local government impact is likely to be a net improvement in fiscal condition.

Communities that are more oriented to agriculture and recreation are likely to see negative impacts. In addition to overall decreases in economic activity, disruptions tend to drive down real estate prices. Since local governments rely on property taxes, the reductions in real estate values could have a negative impact. This issue is problematic for Oregon because assessed value is well below market value for most properties. Hence, market value would have to fall significantly to affect local tax collections. The tax revenue and property values should be more closely correlated in Washington. In both states, there are likely to be changes in business taxes, but these go primarily to the state governments, where they would have a small impact.

3.5.5 Quality of Community Life

Drastic changes in economic conditions typically have negative effects on the quality of community life in the short run. If the change is negative, then the disruptions caused by reduced business and farm income and loss of employment create the negative effects. However, even if the impact is an increase in employment and business activity, there is often a negative effect on the quality of community life due to overcrowding of infrastructure and the demand for more services than the local governments are prepared to provide. In the long run, these effects tend to be mitigated by adaptation to the new level of economic activity. While most communities prefer adapting to growth rather than decline, there is no definitive evidence that growth is necessary to generate a high quality of community life in the long run. Nevertheless, the transition to lower levels of economic activity can create negative effects for long periods of time, and some communities may find that they are no longer economically viable.

There is a potential that the combined effects of increased transportation costs, irrigation costs, and power costs could have a widespread effect on agriculture in the region. The transition would be difficult and many farmers could be pushed into insolvency. This would be particular troublesome if the changes occurred at a time of low agricultural commodity prices, like the present.

While the potential for major impacts on various social measures exists, it is problematic as to whether any large-scale effects would occur. Even within the affected region, the expected employment changes are a relatively small percentage of total employment. These changes are likely to take place over a period of time in which the region is on a growth trend. Hence, the negative effects could be offset by natural growth. Further, the expectation of substantial increases in construction activity further offset the impact in the short run. While potential negative effects have been identified for various groups, the most likely outcome is that negative effects would be geographically concentrated. These effects would be oriented around areas with major changes in activity, such as transportation, and could possibly show up through widespread losses in farming. However, the effects on farming that have been identified do not appear to be outside the range of existing swings in this volatile sector. Hence, it would seem unlikely that they would have disproportionate impacts on the viability of the sector. Again, a geographic analysis might be of greatest benefit in refining the issue, since there are likely to be some lands that are only marginally productive under current cost structures. These are the lands likely to be taken out of production if irrigation and transportation costs rise. They may be geographically concentrated, in which case there would be secondary effects on supporting businesses and communities. However, there appears to be little analysis of the distribution of farms by cost versus revenue. In general, we would not expect that all farms, nor any other business, would be affected in exactly the same way. They are not all "average"; but without further information on the distribution, it is difficult to predict the impact of the expected changes.